

# EXHIBIT I



**Planet Depos®**  
We Make It *Happen™*

---

# Transcript of Paul S. Min, Ph.D.

**Date:** June 12, 2025

**Case:** Phenix Longhorn, LLC -v- Innolux Corporation

**Planet Depos**

**Phone:** 888.433.3767 | **Email:** [transcripts@planetdepos.com](mailto:transcripts@planetdepos.com)

[www.planetdepos.com](http://www.planetdepos.com)

Michigan #8598 | Nevada #089F | New Mexico #566

Transcript of Paul S. Min, Ph.D.

1 (1 to 4)

Conducted on June 12, 2025

1	1	1	3
2	IN THE UNITED STATES DISTRICT COURT	2	A P P E A R A N C E S
3	FOR THE EASTERN DISTRICT OF TEXAS	3	
4	MARSHALL DIVISION	4	ON BEHALF OF THE PLAINTIFF:
5	-----x	5	RODNEY MILLER, ESQUIRE
6	PHENX LONGHORN LLC, :	6	WOMBLE BOND DICKINSON (US) LLP
7	Plaintiff, :	7	1331 Spring Street NW
8	v. : Civil Action No.:	8	Suite 1400
9	INNOLUX CORPORATION and : 2:23-CV-00478-RWS-RSP	9	Atlanta, GA 30309
10	DOES 1-10, :	10	404.879.2435
11	Defendants. : -----x	11	JOHN H. WRIGHT, III, ESQUIRE
12		12	WOMBLE BOND DICKINSON (US) LLP
13		13	555 Fayetteville Street
14		14	Suite 1100
15	Deposition of PAUL S. MIN, PH.D.	15	Raleigh, NC 27601
16	Conducted Virtually	16	919.755.2100
17	Thursday, June 12, 2025	17	
18	11:07 a.m. EDT	18	
19		19	ON BEHALF OF THE DEFENDANTS:
20		20	JEFFREY JOHNSON, ESQUIRE
21		21	BAKER BOTTS
22	Job No.: 586682	22	One Shell Plaza
23	Pages: 1 - 77	23	910 Louisiana Street
24	Stenographically reported by: Judith E. Bellinger,	24	Houston, TX 77002
25	RPR, CRR, CSR-TX, CCR-WA, CCR-NM	25	713.229.1234
2	2	4	4
1	Deposition of PAUL S. MIN, PH.D., conducted	1	A P P E A R A N C E S C O N T I N U E D
2	virtually,	2	
3		3	ALSO PRESENT:
4		4	Ken Lauguico, Planet Depos Technician
5		5	Jonathan Shelnutt, Summer Associate, Womble
6		6	Bond Dickinson
7		7	James Dority, Summer Associate, Womble Bond
8	Pursuant to notice, before Judith E.	8	Dickinson
9	Bellinger, Registered Professional Reporter,	9	Victor Atta-Dakwa, Summer Associate, Womble
10	Certified Realtime Reporter, and E-Notary Public	10	Bond Dickinson
11	in and for the State of Maryland.	11	Parker Hancock, Summer Associate, Womble
12		12	Bond Dickinson
13		13	James Donovan, Summer Associate, Baker Bott
14		14	Noah Harrison, Summer Associate, Baker Bott
15		15	
16		16	
17		17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	

Transcript of Paul S. Min, Ph.D.

2 (5 to 8)

Conducted on June 12, 2025

1	C O N T E N T S	5	7
2	EXAMINATION OF PAUL S. MIN, PH.D.	PAGE	
3	By Mr. Miller	6	
4	E X H I B I T S		
5	(Attached to the transcript)		
6	Min Exhibits:	PAGE	
7	Exhibit 1 Declaration of Paul S. Min, Ph.D.,	8	
8	Regarding Claim Construction for US		
9	Patent Numbers 7,233,305 and		
10	7,557,788		
11	Exhibit 2 United States Patent Number	12	
12	7,233,305 B1		
13	Exhibit 3 United States Patent Number	13	
14	7,557,788 B1		
15	Exhibit 4 Joint Motion for Correction of	31	
16	Exhibit B to the Parties' Joint		
17	Claim Construction and Prehearing		
18	Statement		
19			
20			
21			
22			
23			
24			
25			
1	P R O C E E D I N G S	6	8
2			
3	PAUL S. MIN, PH.D.,		
4	being first duly sworn, was examined		
5	and testified as follows:		
6	EXAMINATION BY COUNSEL FOR THE PLAINTIFF		
7	MR. MILLER: Typically, at least start		
8	the depositions out with at least introducing the		
9	counsel, counsel of record.		
10	I'm Rodney Miller, Womble Bond		
11	Dickinson, on behalf of plaintiff, Phenix		
12	Longhorn, LLC.		
13	MR. JOHNSON: Jeffrey Johnson, from		
14	Baker Botts, on behalf of the defendant.		
15	MR. WRIGHT: This is John Wright, on		
16	behalf of plaintiffs as well.		
17	MR. JOHNSON: This is Jeffrey again. I		
18	have with me today James Donovan, Noah Harrison,		
19	who are summer associates with us at Baker Botts.		
20	They're just listening in to grade Rodney Miller		
21	on his performance.		
22	MR. MILLER: Thank you. Again, I give,		
23	like, C-minus work, I just barely make it all the		
24	time.		
25	But I'll say this: Ms. Bellinger, I do		
1	not have the -- I have the realtime link, and I		
2	see nothing going on here.		
3	Are we typing?		
4	Off the record.		
5	(Off the record.)		
6	MR. MILLER: Back on the record. We're		
7	ready to start.		
8	BY MR. MILLER:		
9	Q Dr. Min, can you, please, state your		
10	full name for the record.		
11	A My name is Paul Min, M-I-N.		
12	Q And have you been deposed before? Have		
13	you been deposed before?		
14	A Yes, I have.		
15	Q How many times?		
16	A I don't have exact numbers, but it is		
17	over 50 times.		
18	Q Okay. I just want to go, just a few		
19	ground rules, just for my purposes.		
20	I'm going to ask you some questions.		
21	Please let me finish before you answer. I will		
22	try to let you answer before I ask my next		
23	question. And this is especially important since		
24	this deposition is fully remote. And please		
25	answer the questions verbally. I just wanted to		
1	start by asking, is there a reason today that you		
2	cannot testify truthfully?		
3	A Not that I can think of, no.		
4	Q Okay. And you're aware that the main		
5	reason for your deposition, or the reason for your		
6	deposition today is because you provided a		
7	declaration in the Phenix Longhorn v. Innolux		
8	Corporation litigation pending in the Eastern		
9	District of Texas, correct?		
10	A That is correct.		
11	MR. MILLER: I'll start out and admit		
12	an exhibit. Do Exhibit 1, the Declaration of Paul		
13	S. Min, Ph.D., Regarding Claim Construction for US		
14	Patent Numbers 7,233,305 and 7,557,788.		
15	Can you please pull that up for me.		
16	(Min Exhibit 1 marked for		
17	identification and attached to the transcript.)		
18	A Mr. Miller, as Mr. Johnson earlier		
19	mentioned, I have freshly printed, unmarked paper		
20	copies with me, for my declaration and two		
21	patents, that I will be discussing today.		
22	Q Okay. I'm just going to confirm that		
23	you don't have any notes written on those, do you?		
24	A I do not have any notes.		
25	Q I'm going to trust Mr. Johnson and		

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

Conducted on June 12, 2025

<p>33</p> <p>1 going to speak for everybody.</p> <p>2 MR. JOHNSON: We'll keep going.</p> <p>3 MR. MILLER: All right. Let's do it.</p> <p>4 BY MR. MILLER:</p> <p>5 Q Okay. We're going to -- all right,</p> <p>6 Dr. Min. We're going to walk through some of your</p> <p>7 opinions as it relates to some of these terms that</p> <p>8 are in dispute in the '305 and the '433 [sic]</p> <p>9 patents.</p> <p>10 <b>A Did you mean '788 patent?</b></p> <p>11 Q '305 and '788 patent. Thanks for</p> <p>12 correcting me, if I said it wrong.</p> <p>13 Before I start here, Dr. Min, did you</p> <p>14 get an opportunity to review the agreed claim</p> <p>15 constructions by the parties?</p> <p>16 <b>A Yes. I saw the list of all agreed</b></p> <p>17 <b>construction as well.</b></p> <p>18 Q Did you review those?</p> <p>19 <b>A Yeah.</b></p> <p>20 Q All right. Do you have any -- do you</p> <p>21 agree with the parties' agreed constructions?</p> <p>22 <b>A I have not really spent time to analyze</b></p> <p>23 <b>my interpretation with regard to the agreed-upon</b></p> <p>24 <b>constructions. So sitting here, I have no opinion</b></p> <p>25 <b>to offer.</b></p>	<p>35</p> <p>1 <b>A Certain type of non-volatile storage</b></p> <p>2 <b>cell would. Not all.</b></p> <p>3 Q But they can, correct?</p> <p>4 <b>A Certain types can, yes.</b></p> <p>5 Q As we say "certain types," what do you</p> <p>6 mean by certain type?</p> <p>7 <b>A There are digital memories made from</b></p> <p>8 <b>nonvolatile cells, like flash memories, or EEPROM,</b></p> <p>9 <b>that's E-E-P-R-O-M, all in capital. They will</b></p> <p>10 <b>store digitized information. By that, most</b></p> <p>11 <b>typically, 1s and 0s. But sometimes you could</b></p> <p>12 <b>have multi-bit symbols that you can store. But</b></p> <p>13 <b>information stored, digital representation of the</b></p> <p>14 <b>actual value, or value to be approximated, at</b></p> <p>15 <b>least.</b></p> <p>16 Q Dr. Min, I just want to confirm here.</p> <p>17 When you reviewed the specifications of the '305</p> <p>18 patent, specifically as it related to nonvolatile</p> <p>19 storage cells -- let's look at your discussion in</p> <p>20 paragraph 30.</p> <p>21 I want to confirm here. Are you</p> <p>22 referencing the embodiment in the specifications</p> <p>23 here, when you say this specification explicitly</p> <p>24 identifies the memory elements as programmable</p> <p>25 analog floating gate memory cells 330 through 337</p>
<p>34</p> <p>1 Q Are you aware, by any chance, that the</p> <p>2 parties' agreed constructions with the</p> <p>3 exception -- sorry, are you aware that the</p> <p>4 parties' agreed constructions, as it relates to</p> <p>5 the '305 patent, they come from the Court's prior</p> <p>6 claim construction order in the Wistron</p> <p>7 litigation.</p> <p>8 <b>A That is my general understanding, but I</b></p> <p>9 <b>have no specific terms that comes to my mind.</b></p> <p>10 Q Let's talk a little bit about</p> <p>11 nonvolatile storage cells.</p> <p>12 Do you teach -- in your classes at</p> <p>13 Washington University, St. Louis, do you teach any</p> <p>14 classes that discuss nonvolatile storage cells?</p> <p>15 <b>A Yes, I do.</b></p> <p>16 Q What are nonvolatile storage cells,</p> <p>17 Mr. Min?</p> <p>18 <b>A Nonvolatile means the data stored in</b></p> <p>19 <b>the cell stays on, even if you remove the power to</b></p> <p>20 <b>the cell. And "cell" here is a general term to</b></p> <p>21 <b>describe the context of memory, of course.</b></p> <p>22 <b>Something that stores a certain amount of</b></p> <p>23 <b>information, certain information.</b></p> <p>24 Q Can a non-volatile storage cell be</p> <p>25 designed to store digital information?</p>	<p>36</p> <p>1 and analog storage cell?</p> <p>2 <b>A It's paragraph 32 or 37?</b></p> <p>3 Q I'm looking at paragraph 30.</p> <p>4 Paragraph 30.</p> <p>5 <b>A Yeah, so in paragraph 30, I'm referring</b></p> <p>6 <b>to what is described in the specification.</b></p> <p>7 Q And when you say "what is described in</p> <p>8 the specification," are you referring to an</p> <p>9 exemplary environment that's in the specification?</p> <p>10 <b>A That would be correct. In this</b></p> <p>11 <b>paragraph 30, that's what I'm talking about, yes.</b></p> <p>12 Q Also in paragraph 31, that's an</p> <p>13 embodiment, correct?</p> <p>14 <b>A Once again, I'm describing here, in</b></p> <p>15 <b>paragraph 31, what is stated or described in the</b></p> <p>16 <b>embodiment as a practicable specification.</b></p> <p>17 Q We're going to jump to paragraph 34.</p> <p>18 This would be page 14 and page 15.</p> <p>19 <b>A Yes.</b></p> <p>20 Q I'm just trying to get a general</p> <p>21 understanding of your positions in paragraph 34.</p> <p>22 <b>A Yes, I have this for you, paragraph 34.</b></p> <p>23 Q Can you explain paragraph 34 to us?</p> <p>24 <b>A So, if the nonvolatile storage cell</b></p> <p>25 <b>was -- I'm still describing the embodiment that's</b></p>

Conducted on June 12, 2025

<p>37</p> <p>1 shown, for example, in Figure 3 of the '305 2 patent. 3 So, nonvolatile storage cell in 4 question, the numeral 330, 331, to 337, and here, 5 if this nonvolatile storage cell, 330 through 337, 6 were digital memories, like a flash memory or 7 EEPROM, then the values there would be some -- as 8 some binary numbers, 10110. If that comes out, I 9 cannot only drive or go through the drive of 340 10 and then through driver 347, respectively, and 11 then drive is a channel 0 through channel 7, 12 connected to the panel. 13 You cannot drive the display panel with 14 1s and 0s. You need to have a voltage. And to do 15 that, if these memories -- the storage is a 16 nonvolatile storage cell, 330 through 337 were 17 outputting 1s and 0s, you could not fully drive 18 that panel through this reference correction. 19 You'll need conversion of this digital values to 20 analog voltage value to do that. And here, what 21 I'm saying is, there is no description, and here, 22 this channel 0 through channel 7 on Figure 3, just 23 to take it back to Figure 2, in Figure 2, the 24 channel zero through channel 7 are shown two 25 places, gamma reference controller 210, and gamma</p>	<p>39</p> <p>1 were digital memory cells, such as flash memory or 2 EEPROM then they would go to driver and then 3 become this channel output, CH0 through CH1, and 4 connected to the panel. And that the claim 5 language says the drivers connected to said 6 storage cell, that would not work. And drivers do 7 not take 1s and 0s, you take a value, and then the 8 value, that value is the actual voltage value, and 9 that goes into the driver and gets connected to 10 the panel. So that would not make sense. 11 Q All right. So are you reading the 12 claim language, and we'll talk about this later, 13 but, I mean, we can talk about it now. Is your 14 interpretation of this based on the fact that when 15 it says "drivers connected to said storage cells," 16 there has to be some direct connection? 17 A Yes. That is correct. 18 Q So we can't -- it can't connect to 19 something through something else? 20 A Not -- no, not in the context of the 21 '305 patent and '788 patent, no. 22 Q We're doing two things at once. We're 23 talking about the storage. We are talking about 24 drivers connected to said storage cells. 25 So let's pull up -- I just want to know</p>
<p>38</p> <p>1 reference controller 220. And channel 0 through 2 channel 7, in both cases, gets connected to a 3 source driver that is attached to the TFT panel 4 280, without having any gateway converter, and 5 this would not work. Therefore, the values stored 6 in nonvolatile storage cells were digital values. 7 Q All right. I got that. 8 And then you go on and say, so this 9 configuration, I'm assuming that you're talking 10 about, from what you're speaking here, figures in, 11 saying in the exhibits, the patent exhibits, you 12 say "This configuration would contradict the 13 explicit language of claim 1, which requires 14 'drivers connected to said storage cells'. 15 A I'm sorry, which paragraph are you 16 reading, please? 17 Q I'm on the last sentence of paragraph 18 34. 19 A 34. Okay. 20 Q Yes, sir. 21 A Yes. That's correct. 22 Q And can you explain what you mean by 23 that, by that last sentence in paragraph 34? 24 A That's what I just said. If 25 nonvolatile storage cell 340 -- or 330 through 337</p>	<p>40</p> <p>1 if you consider -- 2 We'll pause that. I'm going to go back 3 to that "drivers connected to said storage cells." 4 I'm jumping around here. Trying to keep the 5 record a little cleaner. 6 It's nice. All right. So let's pull 7 up, so you had your position on drivers connected 8 to said storage cells. So, it's your position it 9 had to be connected, it can't be through 10 something. 11 Have you considered, in the '305 12 patent, claim 8, just the language of claim 8, 13 where it says an output pin connected to an output 14 pin through a second multiplexer? 15 A If this is a claim 8 -- 16 Q Yeah, last -- 17 A Claim 8. I read that. 18 So in this case, it is explicitly 19 stated that the connection has something in 20 between. So it makes it clear. But when it comes 21 to describing this particular -- the configuration 22 as stated in the paragraph 34, the last sentence, 23 that -- there, here, it's actually -- and the 24 specification directly says that. The 25 specification says this.</p>

Conducted on June 12, 2025

<p>41</p> <p>1 I'm going to refer to '305 patent. 2 Part of the paragraph that starts at line 46, 3 column 1, regarding Figure 1. And here, the last 4 part of the paragraph, starting from line 57, you 5 know, we're talking about all this -- the 6 connection made it to the -- this is GM numbers, 7 and the last sentence says "Since the loading of 8 the source drivers 110, 111, 112, changes 9 dynamically, it is not possible to simply connect 10 the resistive divider," all the resistors listed, 11 "to the inputs of the source drivers," and then it 12 says some type of buffering on -- used, "such as 13 the gamma reference for ICs 170 and 171." 14 It's just a cell. Simply connect means 15 just connected. This is with regard to Figure 1, 16 the prior art embodiment. Just making the 17 connection there is not going to work; you have to 18 have some kind of intermediate. This make it 19 really clear, when the patent describes something 20 is connected to something else, that means making 21 the connection directly, not anything between. 22 In contrast to claim 8, you just 23 described, explicitly explained that the 24 connection has something in between. So that 25 makes it clear.</p>	<p>43</p> <p>1 A I mean, I read claim 8 also. 2 Q I'm asking you, did you consider -- did 3 you consider the use of "connected to" in your 4 analysis of connected to -- 5 MR. JOHNSON: Objection. 6 Q -- in claim 1? 7 MR. JOHNSON: Objection. Form. 8 A Yes, I have considered the patent as a 9 whole, including all claims. 10 Q And we are -- the claim language is "is 11 connected to" and "is coupled to." But throughout 12 the patent, there are numerous source descriptions 13 says something is, something connects to 14 something. So, as opposed to something -- A is 15 connected to B, there are numerous places that 16 says B connects to A, in direct form. And 17 everywhere it is stated that way; the description 18 is consistent. When something connects to 19 something else, or something is connected to 20 something else, in both cases, the connection is 21 direct connection. 22 Despite the fact that claim 8 says A 23 connected to B through C? 24 A Well, as I just mentioned, A is 25 connected to B through C, as an in-between through</p>
<p>42</p> <p>1 Q So claim 8 says an output pin connected 2 to an output through something else. 3 And you're stating that that language 4 contradicts your position where you're saying that 5 connected to has to be directly -- 6 A No. 7 Q -- to connect? 8 A No. 9 Q You don't think? 10 A No, it does not. What this last 11 limitation of claim 8 is saying is, and it says 12 output pin is connected to a second multiplexer 13 which is, in turn, connected to an output. That's 14 what the -- what this sentence you just read from, 15 claim 8, you're referring to. When it says "an 16 output pin connected to an output through a second 17 multiplexer," that means output pin connected to a 18 second multiplexer, which is connected to an 19 output. 20 So that's exactly what I said. When 21 there's a -- the sequence of connection, that's 22 exactly what the claim language is describing. 23 Q So in your analysis of the drivers 24 connected to storage cells, did you consider the 25 language in claim 8?</p>	<p>44</p> <p>1 C. So that means A is connected to C, which is 2 connected to B. That's what that statement is 3 saying. 4 Q All right, Dr. Min. We'll be going 5 back and forth on that one. 6 All right. Let's go back to your 7 statement in the nonvolatile memory, in 8 paragraph 35 on page 15. 9 I'm trying to understand your position 10 here. You say the integrated circuit of claim 1 11 wherein said nonvolatile storage cells hold analog 12 voltage values, you're referring to claim 4? 13 A Yes. 14 Q All right. So isn't -- claim 4 is a 15 dependent claim of claim 1, correct? 16 MR. JOHNSON: Objection. 17 A Yes. That's correct. 18 Q And claim 4 explicitly states that the 19 nonvolatile storage cells hold analog voltage 20 values. 21 I'm trying to understand how you are 22 looking at this to form your next statement here, 23 that you say that this explicit statement, that 24 the cells hold analog voltage (indiscernible) 25 dictates the interpretation arrived in claim 1?</p>



Conducted on June 12, 2025

<p>53</p> <p>1 construction is to say one or more circuit that is 2 selectively coupled, and you say selectively 3 coupled a multiplexer or selectively coupled a 4 demultiplexer? 5 <b>A So the coupler is either doing the --</b> 6 <b>number 1 or number 2, right? So that's what</b> 7 <b>the -- that's what the -- the proposed</b> 8 <b>construction in the Phenix's proposed construction</b> 9 <b>says. You can couple, according to number 1, as</b> 10 <b>shown in this construction, or according to number</b> 11 <b>2.</b> 12 <b>But you also added -- the Phenix also</b> 13 <b>added selectively, in other words, a multiplexer</b> 14 <b>device can do one of these two, depending on what</b> 15 <b>you select the device to do. That does not</b> 16 <b>happen. There's no multiplexer that does that.</b> 17 <b>And --</b> 18 <b>Q I thank you very much, Dr. Min. We'll</b> 19 <b>probably have a conversation with your counsel</b> 20 <b>about that. Because I don't think we -- I just</b> 21 <b>want to get from you is, do you agree that a</b> 22 <b>multiplexer -- again, does a multiplexer have some</b> 23 <b>type of selecting functionality?</b> 24 <b>MR. JOHNSON: Objection to form.</b> 25 <b>A Selecting function with regard to what</b></p>	<p>55</p> <p>1 Does the multiplexer, does it have some type of 2 functionality that allows a selection of those? 3 <b>A Yeah, yeah. So within the confine of</b> 4 <b>one particular multiplexing function, you can</b> 5 <b>dynamically get a generator pattern of the</b> 6 <b>multiplexing. So I wouldn't call it a selectivity</b> 7 <b>coupling. I would say dynamic control, or</b> 8 <b>sometimes called dynamic multiplexer. You do that</b> 9 <b>in real time. So you can do that.</b> 10 <b>Q All right. Thank you very much.</b> 11 <b>All right. Dr. Min, we can jump to the</b> 12 <b>'788 patent. We're jumping to page 33.</b> 13 <b>Talk about your opinion on gamma</b> 14 <b>reference control capabilities.</b> 15 <b>A Yes.</b> 16 <b>Q In your opinion, what is the '305</b> 17 <b>patent directed to?</b> 18 <b>A '305 patent is generally directed to, I</b> 19 <b>think, the gamma correction on a TFT panel, but in</b> 20 <b>some very particular way. And it criticizes as a</b> 21 <b>background prior art existing. And this is part</b> 22 <b>of the background. And then it also criticizes</b> 23 <b>some of the -- contemporaneously, at the time of</b> 24 <b>the '305 patent, some digital-based approach.</b> 25 <b>Which involves a number of additional</b></p>
<p>54</p> <p>1 <b>mode it is doing the multiplexing or</b> 2 <b>demultiplexing, that selection does not exist.</b> 3 <b>Q So it is your opinion that the</b> 4 <b>multiplexer, this is the multiplexer when it goes</b> 5 <b>many to one, it has no type of selecting</b> 6 <b>functionality in it to decide which many to one in</b> 7 <b>the multiplexer?</b> 8 <b>A No, that's not what I am saying.</b> 9 <b>Because it is a selectively coupled. It's</b> 10 <b>selectively on the couple. And the coupling is</b> 11 <b>either one or two, right? You list option 1 or</b> 12 <b>option 2. That's what the construction says.</b> 13 <b>You either -- you couple it according</b> 14 <b>to 1 or you couple according to 2. And then --</b> 15 <b>Q No, I'm not -- Dr. Min, I'm not asking</b> 16 <b>about the construction. I'm asking about,</b> 17 <b>generally, multiplexers and the functionality of</b> 18 <b>multiplexers. I'm asking you to get an</b> 19 <b>understanding of, you have many to one, are we</b> 20 <b>talking about multiplexer or are we talking about</b> 21 <b>demultiplexer, one to many? Within that</b> 22 <b>multiplexer, is there some type of functionality</b> 23 <b>that allows it to select from that many to one?</b> 24 <b>So, you have -- say you've got four</b> 25 <b>going in and it's coming out with one of the four.</b></p>	<p>56</p> <p>1 <b>components. So it -- at the end -- this is column</b> 2 <b>2, starting from about line 7, so the previous</b> 3 <b>conventions. And this is what the sentence is</b> 4 <b>saying: Both inventions teach quite complex</b> 5 <b>digital approaches to this analog problem, so</b> 6 <b>"analog problem" being the gamma correction, the</b> 7 <b>voltage applied as analog value.</b> 8 <b>So -- and then the -- both of the</b> 9 <b>previous prior art was extensive. So what line 10</b> 10 <b>of column 2 is designed to gamma reference</b> 11 <b>architecture that automates gamma adjustment and</b> 12 <b>provides programmable capability and achieves</b> 13 <b>acceptable cost. And this acceptable cost comes</b> 14 <b>from not utilizing this digital approach to the</b> 15 <b>analog problem, which is the gamma correction.</b> 16 <b>Q And what about the '788 patent?</b> 17 <b>A I mean, it's a very similar, but not</b> 18 <b>identical -- identical -- I didn't do, like, a</b> 19 <b>line-by-line comparison, but the specification is</b> 20 <b>very similar. Here, the independent claim recites</b> 21 <b>to calibration of liquid crystal drive, and then</b> 22 <b>using the gamma correction. And, once again,</b> 23 <b>utilizing this analog, the storage cell, and then</b> 24 <b>you have the optical sensors that's, basically,</b> 25 <b>feeding back the correction.</b></p>



Conducted on June 12, 2025

<p>57</p> <p>1 <b>So, that's what '788 patent is.</b></p> <p>2 Q All right. We're looking at the '788.</p> <p>3 We're in the '788 patent here. I'm going to go</p> <p>4 through a few things here. We've got -- go to</p> <p>5 page -- you can pull it up, if you want to.</p> <p>6 Exhibit 3, make it simple, Exhibit 3. We're going</p> <p>7 to look at row 2, looking at the summary of the</p> <p>8 invention. And it says the invention is a</p> <p>9 programmable buffer integrated circuit, which can</p> <p>10 be programmed to output a set of gamma correction</p> <p>11 reference voltages to be used in LCDs. Once</p> <p>12 programmed, the buffer will continuously output</p> <p>13 the program value, the power is removed, and it's</p> <p>14 a voltage value that is stored in nonvolatile</p> <p>15 programmable memory, gamma correction is retained.</p> <p>16 The device incorporates program interface to allow</p> <p>17 the programming of the buffer outputs to the</p> <p>18 desired values during manufacturing and testing of</p> <p>19 the panel. Multiple sets of gamma values can be</p> <p>20 programmed and stored to provide optimized gamma</p> <p>21 correction curves for different users or</p> <p>22 application requirements.</p> <p>23 Did I read that correctly?</p> <p>24 A <b>I think so. Yes.</b></p> <p>25 Q And earlier, you stated, when you gave</p>	<p>59</p> <p>1 have Figure 3.</p> <p>2 You reviewed Figure 3, Dr. Min?</p> <p>3 A <b>Yes.</b></p> <p>4 Q And that is, what, a gamma reference</p> <p>5 controller 300, correct?</p> <p>6 A <b>Yes. That's correct.</b></p> <p>7 Q All right. And then gamma reference</p> <p>8 controller, it comprises a programming engine or</p> <p>9 interface and a multiplexer, programmable analog</p> <p>10 floating gate memory cells through drivers,</p> <p>11 correct?</p> <p>12 A <b>That's correct.</b></p> <p>13 Q All right. And then, we also have in</p> <p>14 here, we've got a Figure 6 as well?</p> <p>15 A <b>Yeah.</b></p> <p>16 Q All right. So I -- so let's look at,</p> <p>17 going to '788, let's look at claim, we're going to</p> <p>18 go to column 7. And we're going to look at some</p> <p>19 of the claim language here. Look at claim</p> <p>20 limitation 1A. And we're going to look at claim</p> <p>21 limitation 1E.</p> <p>22 A <b>Okay.</b></p> <p>23 Q All right. Claims limitation 1a says</p> <p>24 "Providing said display with gamma reference</p> <p>25 control capability, which is electronically</p>
<p>58</p> <p>1 a general summary of the '305 and the '788, you</p> <p>2 said that the '305, at least, had a gamma</p> <p>3 reference on the TFT panel, correct?</p> <p>4 That's what you stated, right?</p> <p>5 A <b>Yes.</b></p> <p>6 Q All right.</p> <p>7 A <b>Because the field of invention is the</b></p> <p>8 <b>TFT and the liquid contrast -- yeah, okay. And</b></p> <p>9 <b>that is more particularly to TFT. But the</b></p> <p>10 <b>restriction to TFT is not necessarily. The LCD</b></p> <p>11 <b>panel works in a similar way.</b></p> <p>12 Q All right. So, what we're looking at</p> <p>13 is we kind of agree it is at least some type of</p> <p>14 programmable buffer, integrated circuit that can</p> <p>15 be used in an LCD panel, generally?</p> <p>16 A <b>Yes, that's correct.</b></p> <p>17 Q And it can be programmed to output a</p> <p>18 set of gamma correction reference voltages to be</p> <p>19 used in those panels, right?</p> <p>20 A <b>Yes. That's correct.</b></p> <p>21 Q Okay. So I just want to go back. We</p> <p>22 have some embodiments in here, too. You talked</p> <p>23 about some of the embodiments. You talked</p> <p>24 about -- you know, talked about Figure 2. In</p> <p>25 Figure 2, it was an architectural design. And you</p>	<p>60</p> <p>1 reprogrammable and nonvolatile."</p> <p>2 And we have claim 1e. "Storing said</p> <p>3 gamma reference voltage level and said gamma</p> <p>4 reference control capability."</p> <p>5 Looking at this, this general</p> <p>6 discussion about specification, trying to get from</p> <p>7 you -- understand from you. Is that -- is it</p> <p>8 possible that that providing said display with</p> <p>9 something, can that providing said display, can</p> <p>10 that gamma reference control capability, could</p> <p>11 that be the integrated circuit that's discussed in</p> <p>12 the specification?</p> <p>13 MR. JOHNSON: Objection to form.</p> <p>14 Q Specifically, the circuit of Figure 2</p> <p>15 and the circuit of Figure 6? I'm sorry, Figure 3.</p> <p>16 My apologies, Figure 3 and Figure 6. I mean, you</p> <p>17 agree the summary of inventions, as you stated, is</p> <p>18 a programmable buffer-integrated circuit, which</p> <p>19 can be programmed to output a set of gamma</p> <p>20 correction references to be used in a liquid</p> <p>21 crystal display, which is a panel.</p> <p>22 A <b>Yes. That, I agree. But let me now</b></p> <p>23 <b>just read the question described here in my</b></p> <p>24 <b>report -- declarations.</b></p> <p>25 <b>If you look at -- I describe this in my</b></p>

Conducted on June 12, 2025

<p>65</p> <p>1 the wording itself, gamma reference control 2 capability, it has something to do with the 3 control in there, right? Storing some values, 4 that is not the entirety of the control. So to 5 me, reading this terminology, it has to do 6 something more than this, but what is required is 7 here. So I don't know where the boundary is. 8 Am I okay if I'm just to have, like, a 9 nonvolatile storage, like a, you know, analog 10 cells or even the flash memory stored at value? 11 Is that good enough? 12 Q It could be, right, Dr. Min? 13 A But then, it says the term, itself, it 14 says, okay, so, here, "Method of calibrating 15 liquid crystal display to desired gamma curve to 16 compensate for the panel to panel manufacturing 17 variations comprising the steps." 18 So in the context of the claim 19 language, claim 1 as a whole, the gamma reference 20 control capability, to a POSA, should do something 21 more than this, just than storing the value. That 22 doesn't have the control aspect of it. 23 So I don't know the boundary of this 24 claim term. And it does not really say anything 25 about the structure in the claim 1.</p>	<p>67</p> <p>1 Like, gamma reference controller, including the 2 program interface. 3 And the program interface part comes 4 from the fact that inconsistency between the 5 Figures 2 and 3 and 6. So where does the 6 programming interface belong to? They are 7 different. And so, using the programming, the 8 Figure 2, the proposed construction is what I have 9 described earlier on, that's shown in my report, 10 under the heading of gamma reference control 11 capability. 12 Q All right. So, Dr. Min, is your 13 problem with this term is the fact that it's just 14 called gamma reference control capability? You're 15 just not comfortable with the name? 16 MR. JOHNSON: Objection. Form. 17 A The name -- the name is describing 18 something. It has a -- it's some kind of 19 capability that is related to gamma -- gamma, 20 what's the rest, gamma voltage controls. Gamma 21 reference controls. Just one second, please. 22 Gamma reference control capability. Yeah, gamma 23 reference control capability. 24 So it's not just to any capability, but 25 it's a capability that's described by the word,</p>
<p>66</p> <p>1 So, if it is a means-plus-function, 2 then I go and take a look at it and see if there's 3 a structure that does this. And that's really 4 what I am talking about here. 5 Q Dr. Min, by any chance, did you take a 6 look at Innolux's IPR regarding the '788 patent, 7 see their positions? 8 A I did not. And, you know, that, my 9 opinion that I just described to you, is described 10 in paragraph 94. It has a -- some kind of 11 capability. Not just storing something, but it 12 has a control capability. And, to me, it's not 13 just to having the value. You have to do 14 something more. 15 And so, it goes on to say -- there's no 16 particular structure that just does that. So I 17 have to look at something more to actually provide 18 the capability portion. And if this is not 19 means-plus-function, which I'm informed to be 20 subject to 112F, and I could not find the 21 structure that actually is just recited, then I'll 22 just do, generally, the gamma reference control 23 capability. What does that mean? There are 24 certain disclosures that describe the structure 25 that describes this. Then what I found is that.</p>	<p>68</p> <p>1 the claim term gamma reference control. 2 Q I see. 3 A So this is gamma reference control. 4 Q All right. I'm speaking -- you're a 5 person of skill in the art, so I'm going to speak 6 hypothetically here. So if we were to call 7 this -- if the claim language said providing said 8 display with gamma reference controller which is 9 electronically reprogrammable and nonvolatile, 10 would that be acceptable to you? 11 MR. JOHNSON: Objection. Form. 12 A Gamma reference controller? I mean, 13 that would be better, but I would still like to 14 see more description. Something that gives me, I 15 know the structure that is related to the 16 capability, as a part of a claim language, that 17 tells me the boundary of the claim. Controller, 18 integrated circuit chip, yeah, then it'll be 19 better. But controller, even could mean something 20 more than just to chips. Controller could be 21 something else. It could even be a software. 22 So -- and I have to be able to know the 23 scope of the claim with a reasonable clarity and 24 this capability does not really give me that 25 clarity.</p>

Conducted on June 12, 2025

<p>69</p> <p>1 Q I'm just trying to understand this. So</p> <p>2 is your issue with the word "capability" that's in</p> <p>3 the claim?</p> <p>4 <b>A I mean, the term as a whole, gamma</b></p> <p>5 <b>reference control capability. But capability is</b></p> <p>6 <b>certainly what triggers it more than anything</b></p> <p>7 <b>else.</b></p> <p>8 MR. JOHNSON: ERod, is this a good</p> <p>9 stopping place, if you're going to switch gears?</p> <p>10 MR. MILLER: Yeah, we can take a break.</p> <p>11 How long do you need, 15 minutes, ten minutes.</p> <p>12 MR. JOHNSON: Just ten minutes is fine.</p> <p>13 MR. MILLER: Okay. Off the record.</p> <p>14 (Recess taken from 1:01 p.m. to</p> <p>15 1:19 p.m.)</p> <p>16 MR. MILLER: Back on the record.</p> <p>17 BY MR. MILLER:</p> <p>18 Q Dr. Min, welcome back.</p> <p>19 <b>A Thank you.</b></p> <p>20 Q We're going to talk about the term</p> <p>21 "control circuit."</p> <p>22 All right. On page -- just jump around</p> <p>23 here. I'll just ask you, Dr. Min, you say that</p> <p>24 the term "control circuit" is a term that's</p> <p>25 generally understood in electrical engineering.</p>	<p>71</p> <p>1 <b>A Okay.</b></p> <p>2 Q I just want you to elaborate on</p> <p>3 paragraph 107. I'll give you a chance to look at</p> <p>4 it, and then I will read through it.</p> <p>5 <b>A Yeah.</b></p> <p>6 Q All right.</p> <p>7 <b>A I just read it.</b></p> <p>8 Q Okay. So when you say that the term</p> <p>9 "control circuit" is a generally understood term</p> <p>10 in electrical engineering, what do you mean by</p> <p>11 that statement?</p> <p>12 <b>A It's some circuitry, as I mentioned to</b></p> <p>13 <b>you, that does control of some -- according to</b></p> <p>14 <b>some objective. But what I am saying in this</b></p> <p>15 <b>paragraph is as a part of -- recited as part of</b></p> <p>16 <b>claim 1 of the '788 patent, it describes various</b></p> <p>17 <b>requirement that the circuitry has to do, but it</b></p> <p>18 <b>doesn't -- you know, I've listed all the</b></p> <p>19 <b>possible -- possibilities that could be the</b></p> <p>20 <b>control circuit. So it doesn't give me the clear</b></p> <p>21 <b>idea as to what is the scope of this claim 1.</b></p> <p>22 <b>That's what I'm trying to say here.</b></p> <p>23 Q Based upon your reading of the claim 1</p> <p>24 of your '788 patent and your reading as it</p> <p>25 pertains to control circuit, would you identify</p>
<p>70</p> <p>1 What do you mean by that?</p> <p>2 <b>A You're referring to paragraph 102?</b></p> <p>3 <b>Could you --</b></p> <p>4 Q If you want to know the specific</p> <p>5 paragraph --</p> <p>6 <b>A Yeah.</b></p> <p>7 Q -- we can talk about paragraph 107.</p> <p>8 <b>A 107.</b></p> <p>9 Q Or I can scratch that question, just</p> <p>10 ask another question.</p> <p>11 What is a control circuit? You, as a</p> <p>12 professor, what is a control circuit?</p> <p>13 <b>A It's a circuitry that controls</b></p> <p>14 <b>something, whatever that underlying objective of</b></p> <p>15 <b>the control is.</b></p> <p>16 Q Is -- would you say that a control</p> <p>17 circuit is a structure?</p> <p>18 <b>A It is a structure because it's a</b></p> <p>19 <b>circuit. So, when I hear the term "control</b></p> <p>20 <b>circuit," it has some boundary that</b></p> <p>21 <b>(indiscernible). It cannot be, like, a</b></p> <p>22 <b>(indiscernible) period, it's a circuit.</b></p> <p>23 Q And we can go to paragraph 107.</p> <p>24 <b>A Okay.</b></p> <p>25 Q I'll just let you review paragraph 107.</p>	<p>72</p> <p>1 here these four things, these are the four things</p> <p>2 that you -- that it could possibly refer to?</p> <p>3 <b>A Yeah.</b></p> <p>4 Q Okay. Which was number 1. The on-chip</p> <p>5 program interface of the gamma reference voltage</p> <p>6 generator, ICs, or integrated circuits?</p> <p>7 <b>A Yes.</b></p> <p>8 Q Number 2, gamma reference generator</p> <p>9 integrated circuit, themselves, which, for</p> <p>10 example, the AG 1A1A, are to be an external</p> <p>11 device, like PC-connected for testing or</p> <p>12 calibration, which might also embody the means for</p> <p>13 executing a predetermined algorithm. You've got</p> <p>14 4, some combination of these and specific subparts</p> <p>15 thereof.</p> <p>16 Right?</p> <p>17 <b>A Yes.</b></p> <p>18 Q That's your understanding?</p> <p>19 <b>A I listed -- as I was reading the term,</b></p> <p>20 <b>and this came to my mind, saying that any of this,</b></p> <p>21 <b>number 4 is sort of like, any combination or some</b></p> <p>22 <b>subpart. So it's just very unclear.</b></p> <p>23 Q And these four points that you have</p> <p>24 here on page 4, paragraph 107, was this based on</p> <p>25 your understanding of the specification?</p>

Conducted on June 12, 2025

<p>73</p> <p>1 A Well, yeah, part, because here, in '788</p> <p>2 patent, it talks about the method of calibrating a</p> <p>3 liquid crystal display. So, you know, we're</p> <p>4 talking about some form of making an adjustment of</p> <p>5 this LCD to, you know, fit the, you know, the</p> <p>6 gamma to the -- the gamma curve. So, yes, it's</p> <p>7 also coming from the specification because, you</p> <p>8 know, AG 1A1A is used as an example in, like,</p> <p>9 figures.</p> <p>10 So 4 and 5 relate -- I'm sorry, 4A and</p> <p>11 4B, and it's describing the chip, AG 1A1A.</p> <p>12 So all this, based on the reading of</p> <p>13 the patent, and trying to figure out what the</p> <p>14 scope of the claim 1 is, and I come up with all</p> <p>15 this possible different scenarios.</p> <p>16 Q All right. Thank you.</p> <p>17 And, Dr. Min, again, I'm going to ask.</p> <p>18 So the means for executing a predetermined</p> <p>19 algorithm, by any chance, did you consider</p> <p>20 Innolux's position taken in its IPR petition in</p> <p>21 drafting this section?</p> <p>22 A Not personally, no.</p> <p>23 Q And I'm going to ask this, so maybe I'm</p> <p>24 going to go into gamma reference voltage level on</p> <p>25 page 51.</p>	<p>75</p> <p>1 correction. So this is a particular term that, I</p> <p>2 think, '788 patent is using. But I think one -- I</p> <p>3 know what gamma correction is.</p> <p>4 Q How about voltage levels? You have</p> <p>5 heard the term voltage levels?</p> <p>6 A Sure.</p> <p>7 Q And voltage levels -- can voltage</p> <p>8 levels be stored as -- can that be stored as</p> <p>9 digital data?</p> <p>10 A In the general context, yes.</p> <p>11 But not as recited in this claim 1,</p> <p>12 because you are talking about this gamma reference</p> <p>13 voltage, none of it is actually on the column,</p> <p>14 it's actually there. And that's where the gamma</p> <p>15 reference voltage levels are first recited.</p> <p>16 And then here, in 1e, it says storing</p> <p>17 said gamma reference voltage level. So it's the</p> <p>18 same one, not digital version of that, what is</p> <p>19 applied to that column. The same gamma reference</p> <p>20 voltage level is stored in this gamma reference</p> <p>21 control capability.</p> <p>22 So whatever is applied on the columns</p> <p>23 of a display panel is also stored, the same one,</p> <p>24 and it has to be the analog value because you</p> <p>25 cannot really apply that voltage level, not the</p>
<p>74</p> <p>1 A Yes.</p> <p>2 Q Can gamma reference voltage levels, can</p> <p>3 they be stored as digital data?</p> <p>4 A No. I think if you read the claim, so</p> <p>5 as a part of claim 1 -- so this gamma reference</p> <p>6 voltage level is coming from stored in the gamma</p> <p>7 reference control capability, which, according to</p> <p>8 1a, is electrically reprogrammable and</p> <p>9 nonvolatile. But this term, it's recited here in</p> <p>10 claim element 1c of the '788 patent, varying gamma</p> <p>11 reference voltage level on columns of a set</p> <p>12 displayable -- set displayed by a control circuit,</p> <p>13 where set control circuit is separate from the</p> <p>14 display.</p> <p>15 And so, you're actually varying the</p> <p>16 voltage level right at the -- on the columns of a</p> <p>17 display panel. So, you know, that voltage level</p> <p>18 has to have an analog voltage in order to vary</p> <p>19 right there, and that cannot come from a digital</p> <p>20 nonvolatile storage cell.</p> <p>21 Q Are you familiar with the term "gamma</p> <p>22 reference voltage levels," outside of the context</p> <p>23 of the '788 patent?</p> <p>24 A I know what gamma correction is, and</p> <p>25 the voltage associated with that, the gamma</p>	<p>76</p> <p>1 digital representation of the voltage level, but</p> <p>2 actual voltage is applied to that column.</p> <p>3 Q And voltage levels have digital</p> <p>4 representation?</p> <p>5 MR. JOHNSON: Object to form.</p> <p>6 A I mean, if you have a digital</p> <p>7 representation before you apply to the column, you</p> <p>8 have to be converted to analog value. I mean,</p> <p>9 that's what drives the column of the display</p> <p>10 panel.</p> <p>11 MR. MILLER: Thank you, Dr. Min.</p> <p>12 Counsel, I pass the witness.</p> <p>13 MR. JOHNSON: I have no questions at</p> <p>14 this time.</p> <p>15 MR. MILLER: Okay.</p> <p>16 THE WITNESS: Thank you.</p> <p>17 MR. MILLER: Thank you very much again,</p> <p>18 Dr. Min, for your time.</p> <p>19 THE WITNESS: Thank you. Good to meet</p> <p>20 you.</p> <p>21 (Off the record at 1:31 p.m.)</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>

Conducted on June 12, 2025

77

CERTIFICATE OF REPORTER - NOTARY PUBLIC

I, JUDITH E. BELLINGER, RPR, CRR, CSR,  
the officer before whom the foregoing deposition  
was taken, do hereby certify that the foregoing  
transcript is a true and correct record of the  
testimony given; that said testimony was taken by  
me and thereafter reduced to typewriting under my  
direction; that reading and signing was not  
requested; and that I am neither counsel for,  
related to, nor employed by any of the parties to  
this case and have no interest, financial or  
otherwise, in its outcome.

IN WITNESS WHEREOF, I have hereunto set  
my hand and affixed my notarial seal this 23rd day  
of June, 2025.

My Commission Expires: November 3, 2028

*Judith E. Bellinger*

NOTARY PUBLIC IN AND FOR  
THE STATE OF MARYLAND